UNITED STATES DISTRICT COURT
DISTRICT OF MASSACHUSETTS

SCANSOFT, INC.,   )
 	
        Plaintiff   )
 	
       v.   )
 	
VOICE SIGNAL TECHNOLOGIES, INC.,
LAURENCE S. GILLICK, ROBERT S.
ROTH, JONATHAN P. YAMRON, and
MANFRED G. GRABHERR,   )
 	
       Defendants   )
	C.A. No. 04-10353-PBS

DECLARATION OF BRUCE BALENTINE
CONCERNING VOICE ACTIVATED DIALING TECHNOLOGY

I, Bruce Balentine, declare as follows.

1.   I am a consultant in the speech recognition industry, in which I have worked for the past twenty years. I believe that, over the years, I have gained expertise in the design and development of commercial speech recognition systems, such as Voice Activated Dialing ("VAD") products, which are at issue in this litigation. For example, I have designed and developed many commercial applications of speech recognition systems for Fortune 500 companies. I also am the inventor or co-inventor of several patents in this field. I have authored a best-selling book and other publications on the design of speech recognition applications and have lectured widely on this subject at speech recognition industry workshops, conferences, seminars, and trade shows. Accordingly, when ScanSoft's counsel asked me to provide a tutorial on speech recognition technology, I felt comfortable doing so. What follows below is my discussion of the art of speech recognition systems, particularly as it relates to United States Patent No. 6,501,966 ("the '966 patent").

chain was filed.   I feel qualified to comment on how one of ordinary skill would have understood the '966 patent as of April 1992 because I was working in the field at that time--and indeed, for many years prior--designing voice activated dialing and other speech recognition products for the telecommunications, office automation, and call center industries. Indeed, by 1992, I had already been awarded a patent in the field and had already authored a number of published books and articles, as cataloged in my C.V.

15.   I believe that one of ordinary skill in the art, circa 1992, would be a person working in the field of speech recognition products for several years and having an education or work experience in software development and/or software product management. This person might be someone working for a speech recognition products company--such as Scott Instruments or Voice Control Systems or one of their competitors at the time--or, perhaps, someone working for a customer of a speech recognition company, such as a telecommunications company or cell phone manufacturer. This "ordinary person" might also have at least some background in or knowledge of telephony--whether from the technical perspective or at least from a marketing or product management perspective.

TUTORIAL ON SPEECH RECOGNITION

16.   The goal of speech recognition systems is to allow users to control or direct computer functions with their voices. A user's voice, in essence, becomes a computer keyboard or telephone keypad. Thus, a user may call a speech-driven customer service hotline to activate a credit card, to check a bank account balance, or to check on the status of an airline flight, without the need for a computer keyboard and mouse. Likewise, a user's voice may be used to dial a telephone number without having to look at and punch the keys on a touch tone phone. This application is particularly useful for "hands-free" use of a mobile cell phone while driving.

Indeed, hands-free use of car phones was one of the primary motivations for developing VAD systems during the mid- to late 1980s, when the mobile phone industry was emerging.

17.   How does this speech recognition work?   How is it deployed in telecommunications networks?   A basic understanding of speech recognition systems would assist one to understand better the inventions claimed in the '966 patent.   I present below a very simplified explanation of speech recognition systems.
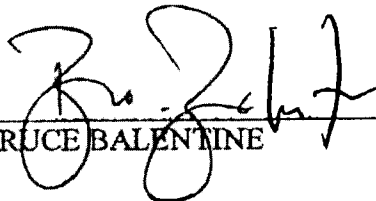
18.   In the abstract, speech recognition attempts to mimic what even toddlers do easily and subconsciously--recognize and understand spoken words.   Training computers to recognize speech has been underway since at least the 1950s but has proven difficult to perfect.   Speech recognition is still marked by a high rate of error.   For example, take two words commonly used in VAD applications, "call" and "dial."   People hear and recognize these terms as two completely different words.   But computers might recognize them as the same.   Over the years, software algorithms have been developed that use statistical models or other schemes to predict with increasing confidence what word was actually spoken.   So in a sense, computerized speech recognition is not an exact science but is rather a set of predictions of the likelihood that a particular word or number has been spoken.   Sometimes the prediction is wrong.   Reducing or preventing errors in speech recognition is thus critical to improving the process.

19.   A common misconception is that speech recognition systems actually "hear" and "understand" words spoken by a user.   In reality, and at a very basic level, computerized speech recognition works by characterizing sounds spoken by the user into acoustic properties, such as frequency and amplitude, and assigning numeric values to these properties.   These numeric values are then analyzed and "scored" using complex word and language models and statistical

keyword." Claim 6 appears to cover this method, which must mean that Claim 1 covers that method and others as well (such as having the command include the number or keyword).

81.   In summary, I believe that one of ordinary skill would have known that variations on the invention could be built and that nothing in the patent constrains the system as VST interprets it.

I DECLARE UNDER PENALTY OF PERJURY THAT THE FOREGOING IS TRUE AND CORRECT. EXECUTED ON MAY 6, 2005.

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BRUCE BALENTINE

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